window structure which produce light when excited by radio frequency emissions transmitted from the antennas.

[0290] In some applications, one or more antennas in one or more windows can be configured to transmit and receive radio waves to determine the range, angle, or velocity of objects exterior to and/or interior to the room or building. More specifically, the antennas can transmit radio waves or microwaves that reflect from any object in their path. The same or different antennas within the windows receive and process these reflected waves to determine properties of the object(s). For example, such a radar implementation can be used for mapping exterior or interior environments. This mapping information can be used to better direct antennas to better receive signals of interest or to better focus transmitted signals to a target (such as a typical base station but also to other buildings, which may themselves be configured as base stations using this antenna technology). Such radar implementations also can be advantageous for security applications. For example, such radar implementations can detect the presence, proximity and even movement of an intruder/trespasser. Indeed, multiple antennas in multiple windows arranged around a building can work in concert to track the trespasser's movements around a building.

[0291] Radar implementations also can be configured to detect weather. For example, the doppler effect is already used by weather stations to detect, classify and predict weather. Such weather information can be useful as another input to a master controller or network controller to determine tint states as well as to trigger changes in other systems including lighting, HVAC and even alarm systems.

[0292] Antennas on or within window also can be used in other identification, personalization, authorization or security applications. For example, antennas within a room can be used to detect signals from RFID tags, bluetooth transmitters, or other transmitters worn or otherwise carried by occupants of a room to determine the identities of the occupants, as well as to determine authorizations, permissions, or security clearances associated with those identities.

Conclusion

[0293] In one or more aspects, one or more of the functions described may be implemented in hardware, digital electronic circuitry, analog electronic circuitry, computer software, firmware, including the structures disclosed in this specification and their structural equivalents thereof, or in any combination thereof. Certain implementations of the subject matter described in this document also can be implemented as one or more controllers, computer programs, or physical structures, for example, one or more modules of computer program instructions, encoded on a computer storage media for execution by, or to control the operation of window controllers, network controllers, and/or antenna controllers. Any disclosed implementations presented as or for electrochromic windows can be more generally implemented as or for switchable optical devices (including windows, mirrors, etc.)

[0294] Various modifications to the embodiments described in this disclosure may be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other implementations without departing from the spirit or scope of this disclosure. Thus, the claims are not intended to be limited to the implementations shown herein, but are to be accorded the widest scope consistent with this disclosure, the principles and the novel features disclosed herein. Additionally, a person having ordinary skill in the art will readily appreciate, the terms "upper" and "lower" are sometimes used for ease of describing the figures, and indicate relative positions corresponding to the orientation of the figure on a properly oriented page, and may not reflect the proper orientation of the devices as implemented.

[0295] Certain features that are described in this specification in the context of separate implementations also can be implemented in combination in a single implementation. Conversely, various features that are described in the context of a single implementation also can be implemented in multiple implementations separately or in any suitable subcombination. Moreover, although features may be described above as acting in certain combinations and even initially claimed as such, one or more features from a claimed combination can in some cases be excised from the combination, and the claimed combination may be directed to a subcombination or variation of a subcombination.

[0296] Similarly, while operations are depicted in the drawings in a particular order, this does not necessarily mean that the operations are required to be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results. Further, the drawings may schematically depict one more example processes in the form of a flow diagram. However, other operations that are not depicted can be incorporated in the example processes that are schematically illustrated. For example, one or more additional operations can be performed before, after, simultaneously, or between any of the illustrated operations. In certain circumstances, multitasking and parallel processing may be advantageous. Moreover, the separation of various system components in the implementations described above should not be understood as requiring such separation in all implementations, and it should be understood that the described program components and systems can generally be integrated together in a single software product or packaged into multiple software products. Additionally, other implementations are within the scope of the following claims. In some cases, the actions recited in the claims can be performed in a different order and still achieve desirable results.

What is claimed is:

1. A building, comprising:

a plurality of windows each having one or more lites, each of the one or more lites having regions that are at least partially transparent to optical wavelengths; and

an antenna structure disposed on a component of each of the plurality of windows, wherein the antenna structure is configured to receive and transmit cellular communications signals.

2. The building of claim **1**, wherein at least some of the plurality of windows comprise electrochromic devices.

3. The building of claim **1**, wherein each of the plurality of windows comprises an electrically conductive layer configured to block the cellular communications signals from or to one or more regions internal to the building.

4. The building of claim **3**, wherein the electrically conductive layer is transparent to optical wavelengths.

5. The building of claim **3**, wherein the cellular communications signals are 5G cellular communications signals.

6. The building of claim **1**, wherein the antenna structure disposed on the component of each of the plurality of